A95 Changes in the Cadaver Decomposition Island (CDI) and Soil Chemistry: An 18-Month Time Series for Scavenged and Protected Human Cadavers

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Learning Overview: After attending this presentation, attendees will have a clear understanding of what a surface human CDI looks like with and without scavenging interference and soil chemical composition results obtained throughout the study. Attendees will understand that the CDI is present months after the remains are removed and the concentration of soil nutrients fluctuate during the decomposition process.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by bringing awareness to those entities participating in search and rescue efforts to not only focus on looking for the skeletal remains of an individual, but to also look for the CDI and collect soil samples at appropriate depths.

Both the CDI and soil nutrient composition are useful pieces of evidence. Typically, during the late phase of the Early stage of human decomposition, fluids of the body, formed during autolysis, hydrolysis, and by other chemical and bacterial actions, leach into the soil under and around the body, producing a CDI. The fluid contains high concentrations of organic matter and microorganisms, eradicating any vegetation adjacent to and under the body. When the soil pH and nutrients in the upper soil horizons appear to return to a level similar to the original state, translocated nutrients in the soil cause native vegetation, and flora not indigenous to that area, to flourish. In August 2018, five cadavers were placed and the CDIs were monitored monthly for vegetation regrowth. Soil samples were taken to a depth of 40cm (in 10cm increments) after purge, then monthly thereafter for a period of 18 months. This study was conducted at the Applied Anatomical Research Center (AARC) in Huntsville, TX.

The study demonstrated that the CDI is greatest under the trunk, reduced under the head, and further reduced under the limbs. The study documents the timing of the formation of the CDI as well as the timing of the return of vegetation around and within the CDI. After collapse of body cavities and formation of the CDI, caged subjects were removed from their CDI at predetermined intervals of zero, two, and four weeks after purging. Cages remained over the CDIs and daily observation occurred until regrowth within the CDI formed. Most of the CDI for subjects accessible to scavenging had formed under the trunk of the body prior to being moved around by scavengers. However, the CDI of the limbs and head could not be clearly identified after movement of the body by scavenging had smeared the soil. Bodies were pulled away from the major part of the CDI by scavengers, but remained at the periphery throughout the study. The trunks of the bodies that had minimal movement by scavenging prolonged the CDI's soil nutrient composition and evidence of nutrient translocation to deeper depths was observed. In search and rescue efforts for missing individuals presumed dead, a CDI may be detectable a minimum of 12 months after death, even if the body has been displaced from its original location. CDI observation and soil chemistry results will be presented.

CDI, Soil Chemistry, Scavenged